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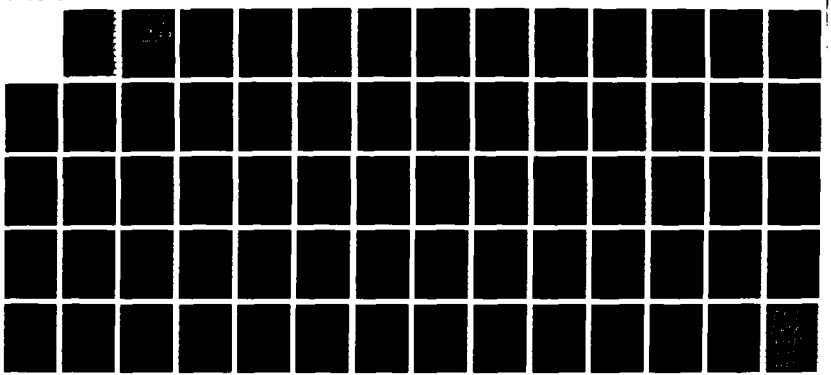

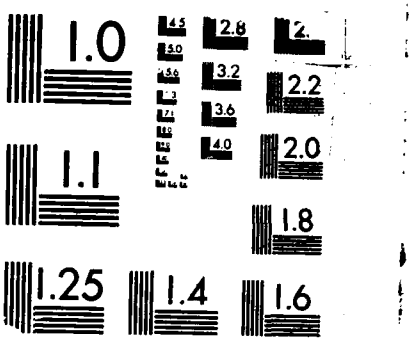

NAVAL POSTGRADUATE SCHOOL

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COST ANALYSIS OF TRAINING OUT OF COMMUNITY NAVAL AVIATORS FOR THE RESERVE PATROL AVIATION FORCE

by

Leo D. Cullen

March 1988

Thesis Advisor: Shu S. Liao

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Cost Analysis of Training Out of Community
Naval Aviators for the Reserve Patrol
Aviation Force

by

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

This study was conducted to determine the cost of training out of community Naval Aviators (Pilots and Naval Flight Officers) into the P-3 Reserve Force. It was designed to assess the cost of training the average Pilot or Naval Flight Officer whose original fleet experience was in an aircraft other than the P-3, and to provide to decision makers information regarding which communities contribute most efficiently to the P-3 Reserve Force. Additionally, the use of these out of community aviators was measured in order to examine manning problems at the P-3 Reserve drilling sites.

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I. INTRODUCTION

In fleet (active duty) aviation squadrons pilots and NFO's are generally trained in one aircraft and stay in that aircraft throughout their careers. While hardware changes do cause, for example, an A-7 pilot to transition to the F/A-18, transfers from one mission or community to another are rare. The Reserve Patrol Aviation Force is unique in that it accepts pilots and NFO's from various communities (A-6, S-3,etc.) and trains them to a point of real usefulness to their P-3 crews. This thesis will attempt to determine the cost of training these so-called "out of community" aviators. In this report, the term "aviator" will refer to both pilots and NFO's. Where a distinction is to be made, pilots and NFO's will be referred to as such.

A. BACKGROUND

Reserve Patrol Aviation squadrons are manned principally by pilots and NFO's who have fleet P-3 experience. Upon leaving active duty, they join Reserve squadrons and continue their service to the P-3 mission, but on a part-time basis. These aviators are preferred over their out of community counterparts because they are useful to the P-3 mission almost immediately.

The Reserve Force, however, depends for its manning primarily on local civilians, and must on occasion accept aviators whose background is not in P-3's.

B. OBJECTIVES

While out of community aviators are used in the P-3 Reserves, as well as in other Reserve communities, the cost of this practice is unknown. This study is intended to assess the cost of using out of community aviators in the Reserve Patrol Aviation Force.

C. THE RESEARCH QUESTIONS

Primary: What is the cost of accepting out of community aviators into the Reserve Patrol Aviation Force and training them to the point of real usefulness to their respective air wings?

Secondary: Do pilots arrive at the point of usefulness sooner than NFO's and, if so, how much?

Secondary: Which communities (A-6, S-3, etc.) supply the quickest, cheapest qualified aviators?

Secondary: Reserve Patrol Aviation occurs at eleven sites nationwide. Which of these sites use out of community aviators the most, and does this signal recruitment difficulties?

D. SCOPE, LIMITATIONS AND ASSUMPTIONS

1. Scope

The scope will include the officer Selected (drilling) Reservists of the 13 Reserve Patrol Squadrons, both pilots and NFO's. Data are available on the out of community aviators in all 13 squadrons, and will be used to determine the cost of training as well as other related issues addressed in this study.

2. Limitations

Reserve Patrol Aviation is represented not only in squadrons but in Master Augment Units and Squadron Augment Units.

Master Augment Units (two exist) will not be addressed in this study since they represent a small portion of the community. Also, they use a more modern version of the P-3 aircraft than the rest of the community, so time required for training (and hence cost) would be incompatible with the other data.

Squadron Augment Units (SAU's) have no aircraft assigned to them and must use those of colocated squadrons. They serve, in part, as basic training units and often transfer aviators into one of the 13 squadrons that are under study. While the SAU's will not be directly included in this study, it may happen that many out of community aviators who achieve success in squadrons began their

training while attached to SAU's, so the determination of their training costs must reflect this.

3. Assumptions

This study will assess the cost of training out of community aviators from initial Reserve affiliation to full readiness. While this might imply that those coming to the Reserves with active duty P-3 experience are immediately at full readiness, this is not always the case. Those who join the Reserves directly from active duty P-3 squadrons are virtually at full readiness and immediate usefulness to their squadrons. Many, however, leave active duty during a shore duty tour that is disassociated from flying P-3's. The longer the period of time between active duty P-3 service and P-3 Reserve affiliation, the longer the training period in the Reserve squadron will be. The costs determined in this study are to be considered as over and above those of a recent Reserve affiliate with fresh fleet experience.

E. METHODOLOGY

The main thrust of the study will be to determine the described costs by analyzing the time required for the out of community aviators to reach usefulness, and using this time information to calculate: drill pay expended; salary spent on Active Duty for Training (ACDUTRA); hardware costs

for the operation of Weapon System Trainers (WST's , Operational Flying Trainers (OFT's), and P-3 aircraft; and instructor costs. Recent surveys conducted by the Commander, Reserve Patrol Wing Pacific and the Commander, Reserve Patrol Wing Atlantic will quantify the time involved. Information on pay and on aircraft and equipment operating costs will be sought from other sources.

F. ORGANIZATION

Chapter II will describe as background the general Reserve environment and the unique Reserve Patrol Aviation setting.

Chapter III will list the training directives which dictate the minimum P-3 Reserve training requirements that must be met. It ends by defining the measure of success for out of community aviators.

Chapter IV will explain the actual calculation of all pertinent costs and will interpret survey information.

Chapter V will manipulate the survey data to find answers to the three secondary research questions.

Chapter VI will draw conclusions about the costs incurred, address issues raised by the research questions, and suggest areas for further research.

II. RESERVE PATROL AVIATION

This chapter will provide a general description of the Naval Reserve and Reserve Patrol Aviation. A look at the various obligations this community must meet and at the constraints it must operate under are necessary prerequisites to understanding the training requirements that will be subsequently described.

A. THE RESERVE SETTING

The history of the Naval Reserve dates to March 3, 1915, when it was established. It has played a key role in wars and conflicts since then. For example, "In World War II, approximately seventy-five percent of the officers and enlisted men who served on active duty with the Navy were Reservists." [Ref. 1: p. 2-1]

1. Organizational Structure

The Reserve Force structure today consists of two main groups. The larger is the Ready Reserve, and the other is comprised of retired personnel and Standby Reservists. The Ready Reserve is further divided into Active Duty Reservists and Inactive Duty Reservists. The Active Duty Reservists serve full time with Regular Navy forces, or may be designated as TAR's (Training and Administration of Reserves). TAR's serve full time as

administrators of the Naval Reserve, coordinating day-to-day activities and providing continuity. The Inactive Duty Reservists are made up of three groups: drilling Selected Reservists (SELRES), often called "weekend warriors"; students in any of the training programs for NROTC; and those in the Individual Ready Reserve. [Ref. 1]

SELRES personnel are required to perform four drills (which are four-hour work periods) per month and two weeks of Active Duty for Training (ACDUTRA) per year. Many SELRES who occupy billets in high skill areas, such as pilots and NFO's, are authorized additional drills each year to maintain proficiency. Special Active Duty (SPECAC), which is that active duty performed in addition to ACDUTRA, is also often authorized. [Ref. 2: p. 11] SELRES personnel are the primary subject of this study.

2. Direction

The success of the Naval Reserve has resulted in plans for its growth. SELRES personnel are expected to grow from 110,000 in October 1985 to 132,600 by the end of 1990. TAR personnel are expected to grow from approximately 15,000 in fiscal year 1984 to approximately 25,000 in fiscal year 1990. This expansion reflects increasing pressure to transfer more missions to the Naval Reserve. [Ref. 1]

The expansion of the Naval Reserve is not limited to sheer growth in numbers. The services have been asked to provide "...an annual report outlining changes that will be accomplished to provide the Guard and the Reserves with: new missions, more modern equipment, and greater integration with the active forces." [Ref. 3] Increasing the integration with regular forces reflects a confidence in the Reserves. The Reserves are growing, not just in an effort to reduce overall mission costs, but as a result of their effectiveness.

B. THE VP RESERVE SETTING

1. Missions and Obligations

The fixed-wing Patrol (VP) Reserve community is obligated to train SELRES air crews to be ready in the event of Reserve Force mobilization. Short of this mobilization, these crews are to be capable of integrating with their regular force counterparts. Also, the Master Augment Units (MAU's) and Squadron Augment Units (SAU's) previously described are to be ready to join (augment) regular force squadrons upon request.

Under this umbrella of obligations lie the missions that VP Reserve squadrons must pursue. Anti-Submarine Warfare (ASW) is the primary mission of the VP Reserve. This includes long-range search, localization, tracking,

and attack capability on target submarines. The ability of the P-3 aircraft to travel long ranges and fly low economically also make it an excellent surface surveillance platform. Additional missions include aerial mining, Anti-Surface Warfare, logistics support, and various carrier task group services.

The effort to fulfill these obligations and missions is complicated by the Reserve manning problem. SELRES civilians cannot, of course, be transferred to the area of highest need, as is the case for their Regular Navy counterparts. Crew members must be drawn from a more or less local pool of talent.

2. Community Description

a. Wing Organization

The VP Reserve community reports to the Commander, Naval Air Reserve Force (COMNAVAIRESFOR) at NAS New Orleans, Louisiana. It is organized into two wings. Table 1 outlines the squadrons of the Reserve Patrol Wing Atlantic, along with their geographic locations. The Commander, Reserve Patrol Wing Atlantic (COMRESPATWINGLANT) is located at NAS Norfolk, Virginia. Table 2 outlines the squadrons of the Reserve Patrol Wing Pacific. The Commander, Reserve Patrol Wing Pacific (COMRESPATWINGPAC) is located at NAS Moffett Field, California.

TABLE 1

RESERVE PATROL WING ATLANTIC

SITE	SQUADRON
NAF Detroit, MI	VP-93
NAS Jacksonville, FL	VP-62
NAS New Orleans, LA	VP-94
NAS South Weymouth, MA	VP-92
NAF Washington, DC	VP-68
NAS Willow Grove, PA	VP-64
NAS Willow Grove, PA	VP-66

TABLE 2

RESERVE PATROL WING PACIFIC

SITE	SQUADRON
NAS Glenview, IL	VP-60
NAS Glenview, IL	VP-90
NAS Memphis, TN	VP-67
NAS Whidbey Island, WA	VP-69
NAS Moffett Field, CA	VP-91
NAS Point Mugu, CA	VP-65

b. Squadron Composition

Squadrons are organized into several major departments.

The Administrative Department maintains and updates squadron personnel records, prepares ACDUTRA orders for SELRES personnel and TAD orders for those on active duty. It also monitors SELRES and active duty retention, administers legal justice, tracks drill pay, and coordinates educational services. Additionally, it serves the Commanding Officer in projects of his choosing.

The Maintenance Department is responsible for repairs to assigned aircraft, and periodically services transient aircraft. Preventive maintenance is accomplished and recorded at several different time intervals. Quality Assurance standards are set and policed continually. Training of both SELRES and active duty technicians is coordinated, documented, and reviewed. Also, supplies of both routine and extraordinary items are inventoried, ordered, and charged to the proper accounts.

The Safety/NATOPS Department is charged with ensuring that all required safety training is conducted, concerning both ground and flying safety. Responsive safety feedback systems are put in place to heighten safety awareness. Also, the Naval Aviation Training and Operational Procedures Standardization (NATOPS) program is

monitored continuously. This system of annual open-book examinations, closed-book examinations, and check flights for all aircrew personnel ensure safe flying practices. Furthermore, each squadron must have an annual NATOPS unit evaluation, given by outside inspectors. The Safety/NATOPS Department coordinates these visits.

The Operations Department transforms plans into actions by writing a daily flight schedule. It must program all flights required for any given day, and match them with the particular aircraft available from the Maintenance Department. It also schedules any daily aircrew training required, and maintains flight time records, both for fiscal accounting purposes and for individual aircrew records.

The Training Department uses the available aircrew manpower pool to construct the best mix of air crews possible. It ensures that each crew maintains the required crew qualifications for maximum readiness. Also, it must anticipate any losses of manpower and plan for maximum readiness in the long run. Additionally, the Training Department plans the ACDUTRA, trying not only to satisfy the needs of the operational commander involved, but also to obtain for each crew the experience that will provide the most improvement. Thus, the Training Department plans and schedules events to maximize the

readiness of individual crew members as well as that of cohesive crews.

3. Day-to-Day Operations

Operations of a VP Reserve squadron are cyclical in nature. Most tasks are performed either in anticipation of or in concert with drill weekends. Since the population on board swells by a factor of six or more during drill weekends, detailed and extensive planning and scheduling are critical. Also cyclical in nature are the ACDUTRA periods. A squadron will normally complete its ACDUTRA as a whole during one time of the year, but outside factors may dictate that it be divided into two or more segments, with different crews conducting their ACDUTRA periods at different times.

Within these cyclical constraints various operations are conducted. Crews are launched on practice flights or on flights augmenting fleet units. Crews also train and test themselves in simulators, several of which are located throughout the country, resulting in necessary logistics flights to these simulator sites. Pilot training flights are scheduled to maintain pilot proficiency. Evaluations in such areas as NATOPS and weapons loading are conducted. Paperwork audit functions are performed on a periodic basis. Ground training is conducted for ground technicians as well as for aircrew personnel. Scheduled

and unscheduled maintenance are also performed on the aircraft.

C. SUMMARY

The Naval Reserve in general, and the VP Reserves in particular, operate under conditions much different from those of the Regular Navy. An understanding of the nature of the VP Reserve community, such as drill weekends, annual ACDUTRA periods, and the manning limitations involved, will permit a better understanding of the training requirements involved, which are addressed in the next chapter.

III. TRAINING

This chapter will describe the training requirements which the Commander, Naval Air Reserve Force (COMNAVAIRESFOR) has imposed on the VP Reserves, with emphasis on those requirements that apply to the out of community (labelled "first tour" in the governing directives) aviators who are the subject of this study. Based on these training constraints a definition will be developed for a "point of usefulness" for out of community aviators -- that point in training where a "first tour" P-3 aviator is not only safe and competent, but contributes fully to the success of any mission his crew should undertake.

A. GENERAL REQUIREMENTS

COMNAVAIRESFOR seeks to maintain the "...highest possible standards of individual readiness" [Ref. 4: p. B-IV-1-1] for all aviators under his command. To this end he has issued directives that address all aviation communities [Ref. 4] and, more applicably here, the VP community [Ref. 5].

For standardization and safety reasons, COMNAVAIRESFOR demands support of and compliance with the Naval Aviation Training and Operational Procedures Standardization

(NATOPS) program [Ref. 6]. NATOPS requirements are embedded in COMNAVAIRESFOR's own training requirements.

COMNAVAIRESFOR has additionally stated that "The use of special ACDUTRA (Active Duty for Training) for formal training courses that complement syllabus training is strongly encouraged." [Ref. 4: p. B-IV-1-1]

Training of all VP flight crew members is conducted according to prescribed phases. All flight crew members will be assigned in one of the four phases. Phase I is initial basic ground and safety training. Phase II is formal school training, described later in greater detail, and separately for pilots and NFO's. Phase III is a specific ground and flight training syllabus, again different for pilots and NFO's. Phase IV training is that required to maintain proficiency once qualification has been achieved. Because it is post-qualification training it is of no further concern in this study. [Ref. 5: p. IV-1-1]

B. PILOT REQUIREMENTS

The following definitions will enable an understanding of pilot training requirements.

A Patrol Plane Third Pilot (PP3P), the first level of qualification for pilots, is "...qualified and designated by his Commanding Officer to act as relief copilot on a

patrol aircraft in the performance of any assigned mission, under all weather conditions." [Ref. 5: p. IV-2-1]

A Patrol Plane Second Pilot (PP2P), the second level, is "...qualified and designated by his Commanding Officer to act as copilot on a patrol aircraft in the performance of any assigned mission, under all weather conditions." [Ref. 5: p. IV-2-1]

A Patrol Plane Commander (PPC), the highest level, is "...qualified and designated by his Commanding Officer to command a patrol aircraft and crew in the performance of any assigned operational or training mission, under all weather conditions." [Ref. 5: p. IV-2-1]

1. Formal School Requirements

The formal schools required for pilots depend on the position (PP3P, PP2P, PPC) sought. The Pilot Systems FAM course is required for PP3P, the Pilot Review course is required for PP2P, and the Patrol Plane Commander course is required for PPC. These schools are to be completed while the pilot is enrolled in phase III of the position he is seeking (PP3P, etc.). [Ref. 5: p. IV-1-1]

2. Time Limitations

Pilots are expected to complete all training requirements for designation (listed in paragraph 3 following) according to the time limits described in Table 3. Pilots unable to qualify as PP3P, PP2P or PPC within

these time limits shall appear before a Pilot/NFO review board for disposition [Ref. 5: p. IV-2-2].

3. Qualification Requirements

Specific Qualification Requirements, according to pilot position, are listed below.

a. Patrol Plane Third Pilot (PP3P)

- Completion of PP3P Phase II
- Completion of PP3P Phase III
- Attainment of minimum flight hour requirements (See Table 4)
- Current Instrument Rating
- Successfully complete open and closed book NATOPS examinations
- Designation by the Commanding Officer

b. Patrol Plane Second Pilot (PP2P)

- Completion of PP3P training
- Completion of PP2P Phase II
- Completion of PP2P Phase III
- NATOPS standardization evaluation
- Attainment of minimum flight hour requirements (See Table 4)
- Designation by the Commanding Officer

c. Patrol Plane Commander (PPC)

- Designation as PP2P
- Completion of PPC Phase II
- Completion of PPC Phase III
- Attainment of minimum flight hour requirements (See Table 4)
- Current NATOPS evaluation
- For pilots outside the aircraft custodian's command, a formal endorsement of the letter of designation is required
- Designation by the Commanding Officer

[Ref. 5: p. IV-2-3, IV-2-4]

TABLE 3

PILOT MINIMUM TRAINING PROGRESS

Phase I completed within 4 months of affiliation
Phase III (commences when phase I completed)

to PP3P	Max. 12 months in Phase III
to PP2P	Max. 24 months in Phase III
to PPC	Max. 36 months in Phase III

[Ref. 5: p. IV-2-2]

TABLE 4

PILOT FLYING HOUR REQUIREMENTS FOR DESIGNATION

DESIGNATION	TOTAL	P-3
PP3P	350	35
PP2P	500	200
PPC	900	300

[Ref. 5: p. IV-2-2, IV-2-3]

C. NFO REQUIREMENTS

The following definitions will enable an understanding of NFO training requirements.

A Patrol Plane Navigator (PPN), the first level of qualification for NFO's, is "...qualified in point to point navigation of a patrol aircraft." [Ref. 5: p. IV-3-1]

A Patrol Plane Tactical Navigator (PPTN), the second level, is "...qualified to conduct the navigation of a patrol aircraft on any ASW mission." [Ref. 5: p. IV-3-1]

A Patrol Plane Tactical Coordinator (PPTC), the highest level, is "...qualified to direct a patrol aircraft flight crew on any ASW mission." [Ref. 5: p. IV-3-1]

1. Formal School Requirements

The formal schools required for NFO's depend on the position (PPN, PPTN, PPTC) sought. The P-3 T/N MOD Navigation course and the Basic CEL/NAV course are required for PPN, the ASW Indoc course is required for PPTN, and the P-3 T/N MOD TACCO course is required for PPTC. These schools are to be completed while the NFO is enrolled in Phase III of the position he is seeking (PPN, etc.). [Ref. 5: p. IV-1-1, IV-1-2]

2. Time Limitations

First Tour NFO's are expected to complete all training requirements for designation (listed in paragraph 3 following) according to the time limits described in Table 5, with one exception. "Commanding Officers may authorize NFO's to remain PPTN's." [Ref. 5: p. IV-3-2]

TABLE 5

NFO MINIMUM TRAINING PROGRESS

Phase I completed within 4 months of affiliation
Phase III (commences when Phase I completed)

to PPN	Max. 24 months in Phase III
to PPTN	Max. 42 months in Phase III
to PPTC	Max. 60 months in Phase III

[Ref. 5: p. IV-3-1, IV-3-2]

3. Qualification Requirements

Specific Qualification Requirements, according to NFO position, are listed below.

a. Patrol Plane Navigator (PPN)

- Completion of PPN Phase II
- Completion of Aircrew Evolutions 1 through 3 of PPTN Phase III
- Satisfactory completion of the enroute portion of the A-12-U (NAVEX) as certified by the RESFORON Tactical Analysis Board (STAB)
- Navigator NATOPS standardization evaluation
- Designation by Commanding Officer

b. Patrol Plane Tactical Navigator (PPTN)

- Designation as PPN
- Completion of PPTN Phase II
- Completion of PPTN Phase III
- Satisfactory completion of the tactical portion of the A-12-U (NAVEX) as certified by the RESFORON Tactical Analysis Board (STAB)
- Navigator NATOPS standardization evaluation
- Designation by Commanding Officer

c. Patrol Plane Tactical Coordinator (PPTC)

- Designation as PPTN
- Completion of PPTC Phase II
- Completion of PPTC Phase III
- Tactical Coordinator oral review
- Tactical Coordinator NATOPS standardization evaluation
- Designation by Commanding Officer

[Ref. 5: p. IV-3-2, IV-3-3]

D. POINT OF USEFULNESS DEFINED

An examination of the qualification requirements for pilots reveals that a NATOPS standardization evaluation is required for designation as PP2P. Since PP2P's can act as copilot on any assigned mission, successful completion of a

NATOPS standardization evaluation will, for study purposes, constitute a training "success" for out of community pilots.

A look at the qualification requirements for NFO's reveals that a NATOPS standardization evaluation is required for designation as PPN. Since PPN's are qualified to conduct point-to-point navigation anywhere, successful completion of a NATOPS standardization evaluation will constitute a training "success" for out of community NFO's. Indeed, since first tour NFO's are required to progress only through PPTN, a successful NATOPS evaluation does indicate real usefulness.

This contention that, for out of community aviators, a successful NATOPS evaluation indicates success for the aviator and real usefulness for his squadron, has been supported by the opinions of others [Refs. 7 and 8]. Therefore, the data in the following chapter describe the costs incurred from the time of an out of community aviator's first affiliation with a P-3 Reserve unit until his initial successful NATOPS evaluation.

IV. TRAINING COSTS

This chapter assesses the cost of training the average out of community aviator into the P-3 Reserve Force. The focus will be on data collected by the staffs at Commander Reserve Patrol Wing Atlantic (COMRESPATWINGLANT) and Commander Reserve Patrol Wing Pacific (COMRESPATWINGPAC). The information collected on each aviator includes length of training period, paygrade during training, original aircraft flown, number of drills performed during training, number of Active Duty for Training (ACDUTRA) days during training, flight time during training, and simulator time during training.

A. THE DATA

The data indicate there are 91 out of community aviators (24 pilots and 67 NFO's) in the P-3 Reserve Force who are qualified. The whole community consists of 844 qualified aviators, so the out of community aviators comprise 10.78 percent of the force.

Of the 91 aviators of concern, 25 will not be under study because of insufficient data collected on them (one or more data items are missing). Also, the data on eight others has been rejected as too old to be of value. In these cases the training took place at least 10 years prior

to the data collection, which was November, 1987. Data on the remaining 58 aviators (14 pilots and 44 NFO's) was the basis for this study. A breakdown of the 58 aviators by designator and original community is given in Table 6.

TABLE 6

THE SUBJECT AVIATORS BY ORIGINAL COMMUNITY

COMMUNITY	PILOTS	NFO's	TOTAL
S-3	2	10	12
A-6/EA-6B	3	9	12
C-130	3	7	10
F-4/F-14	0	7	7
A-3	0	6	6
E-2	2	2	4
C-118	0	2	2
A-4	2	0	2
C-131	1	0	1
RA-5C	0	1	1
CH-53	1	0	1
Total	14	44	58

Average statistics for the 58 aviators are summarized below:

- Average length of training period 22 months
- Average rank and years of service LCDR over 11
- Average drills during training 122
- Average ACDUTRA days during trng. 31
- Average flight hours during trng. 182
- Average simulator hrs. during trng.
  - pilot 27
  - NFO 22

B. PERSONNEL COSTS

1. Drill Pay

Table 7 lists the average annual drill pay paid to Reserve Lieutenants and Lieutenant Commanders from 1982 through 1985. A conversion to 1987 dollars is appropriate since the data collected by the COMRESPATWINGLANT and COMRESPATWINGPAC staffs was drawn from the November 1987 crew lists for all 13 P-3 Reserve squadrons. This conversion has been accomplished in the body of Table 7 with the use of deflators. The 1985 costs show a significant increase over 1984 because the costs of retirement benefits have been included.

TABLE 7

AVG. ANNUAL DRILL PAY & ALLOWANCES

FY	LT's	DEF.	1987$	LCDR's	DEF.	1987$
82	4125	.8397	4912	4755	.8397	5663
83	4377	.8756	4999	5034	.8756	5749
84	4636	.9022	5139	4921	.9022	5454
85	6577	.9419	6983	7523	.9419	7987

[Ref. 9, 10]

Since the bulk of the training for our average aviator was conducted in 1984, and since the average rank for the 58 aviators was Lieutenant Commander, $5454 was selected from Table 7. This figure, however, is an average for all Reservists, most of whom perform 48 drills per

year. Dividing the $5454 by 48 and multiplying by 122 (the average number of drills performed in training) results in a drill pay expenditure during the average training period of $13,862.

2. ACDUTRA pay

Table 8 lists the average annual ACDUTRA pay paid to Reserve Lieutenants and Lieutenant Commanders from 1982 through 1985. The conversion to 1987 dollars has again been done in the body of the table.

TABLE 8

AVG. ANNUAL ACDUTRA PAY & ALLOWANCES

FY	LT's	DEF.	1987$	LCDR's	DEF.	1987$
82	1311	.8397	1561	1500	.8397	1786
83	1334	.8756	1524	1562	.8756	1784
84	1616	.9022	1791	1916	.9022	2124
85	1897	.9419	2014	2269	.9419	2409

[Ref. 9, 10]

Using 1984 as the appropriate year and Lieutenant Commander as the rank, $2124 was selected from Table 8. This figure, however, is an average for all Reservists, most of whom perform 14 days of ACDUTRA per year. Dividing the $2124 by 14 and multiplying by 31 (the average number of ACDUTRA days in training) results in an ACDUTRA pay expenditure during the average training period of $4703.

3. Instructor Costs

One research study that deals with training P-3 aviators in the active duty training command [Ref. 11] was able to accurately assess instructor costs. In that environment all flights in either the P-3 aircraft or in simulators are designated training flights in which active instruction is always taking place. An accurate accounting could thus be made of the instructor costs involved. The environment in a P-3 Reserve squadron is different. On some aircraft flights, of course, training is done, with the active involvement of an instructor. On others, however, it is not. Likewise, in simulator exercises, training is sometimes conducted by an instructor, and sometimes the crew practices for its own benefit, with no formal instruction. Further, little documentation exists which describes the proportion of flight time or simulator time that is dedicated to instruction.

For purposes of this study, the assumption is made that half the flight time for the average aviator (91 hours) and half the simulator time (11.5 hours) has been under the direction of an instructor. This sum (102.5 hours) will be used to calculate the instructor costs involved. Since the instructors are usually Lieutenant Commanders, and the bulk of instruction was done in 1984, the same figure of $5454 from Table 7 will be used as a

base. This $5454, when divided by 48 drills, yields a drill pay salary of $113.63 per four-hour drill, or $28.41 per hour. This, multiplied by the 102.5 hours of instruction time per training period, results in an average instructor cost per training period of $2912. ACDUTRA pay for instructors is disregarded here since the ACDUTRA periods are spent flying missions, with little time for individual instruction.

C. EQUIPMENT COSTS

1. P-3 Operating Costs

Table 9 lists the P-3B average operating cost per hour, including fuel and depot level repairable maintenance. Again, since the bulk of training was conducted in 1984, the 1984 operating cost per hour (in 1987 dollars) of $854 is multiplied by the average number of flight hours flown during training (182). This figure is divided by the number of officers on board the P-3 (5), resulting in an average P-3 operating cost per training period of $31086.

TABLE 9

P-3B OPERATING COST PER HOUR

FY	82	83	84	85
COST	882*	907*	886	1094
DEF.	1.139	1.081	1.038	1.028
1987$	774*	839*	854	1064

*estimated
[Ref. 10, 12]

2. Simulator Operating Costs

Some problems exist regarding the data collected on simulator usage. Fourteen of the 58 cases used had no information on simulator time used. Hence, the average simulator time per training period was computed with a base of 44 samples instead of 58. The records of initial NATOPS qualification are standardized and complete. Likewise, flight time is accurately recorded in aviators' log books according to standard procedures. The recording of simulator training time, however, is not standardized. Some squadrons hold complete records and some do not. Also, several of the 44 pieces of data submitted were admittedly estimates.

Further complicating the issue of simulator training is the fact that several different simulators are used throughout the country, all with different operating costs. This study will use simulator cost data assembled by the Training Office of the Commander Naval Air Force,

U.S. Atlantic Fleet, located in Norfolk, Virginia [Ref. 11: p. 39].

Table 10 lists simulator operating costs per hour, and is broken down into two areas. The 2F87F flight simulator is used only by pilots, and the 2F87T is used by both pilots and NFO's. These devices simulate the P-3C, which is a more modern version of the P-3B that is used in the Reserves. Since the costs of operating a P-3B simulator are put at .93 times the cost of operating a P-3C simulator [Ref. 13: p. 39], data from Table 10 will be multiplied by .93 in the calculation process.

TABLE 10

SIMULATOR OPERATING COST PER HOUR

FY	82	83	84	85
2F87F				
COSTS	210	180	291	212
DEF.	.8328	.8654	.8974	.9288
1987$	252	208	324	228
2F87T				
COSTS	160	135	101	173
DEF.	.8328	.8654	.8974	.9288
1987$	192	156	113	186

[Ref. 10, 11: p. 39]

a. Pilots

The entry of $324 for pilot usage is drawn from Table 10. Multiplying this by the P-3B correction factor of .93 results in $301.32. This figure multiplied by the

average pilot simulator hours per training period (27) yields $8136. Since these flight simulators serve one instructor and one student at any one time, this full amount is charged to the pilot training cost.

b. NFO's

The entry of $113 for NFO usage is drawn from Table 10. Multiplying this by the P-3B correction factor of .93 results in $105.09. This number multiplied by the average NFO simulator hours per training period (22) yields $2312. Since these simulators serve two student NFO's at any one time, the $2312 is divided by two to yield $1156 charged to the NFO training cost.

Since the pilots represent 24 percent of our sample group of 58 aviators, the $8136 is multiplied by .24 to arrive at a pilot contribution of $1953. Since the NFO's represent 76 percent of our sample group of 58 aviators, the $1156 is multiplied by .76 to arrive at an NFO contribution of $879. Adding the pilot contribution of $1953 and the NFO contribution of $879 results in a simulator operating cost of $2832 per trainee.

D. SUMMARY

The average total costs to train an out of community aviator, based on the data from 58 of the 91 total subjects, are summarized in Table 11.

TABLE 11

AVERAGE TRAINING COST SUMMARY

Average drill pay costs		13,862
Average ACDUTRA pay costs		4,703
Average instructor costs		2,912
Average P-3 operating costs		31,086
Average Simulator operating costs		
Pilots	1,953	
NFO's	879	
total		2,832
Average total cost		55,395

The above analysis includes assumptions about instructor costs that may leave the reader with some uncertainty. Also, the incomplete nature of the data on simulator costs contributes to this uncertainty. The author feels, however, that this is the best possible attempt at determining the training costs for out of community aviators given the level of completeness of the data and the nature of the P-3 Reserve community.

The main conclusion of this chapter is that the real importance of this thesis will be found not in the absolute dollar costs determined here, but in the comparative costs that will be described in Chapter 5. That is, the Secondary Questions will, for the decision maker, become the ones of prime interest.

V. COMPARATIVE ANALYSES

The cost of training out of community aviators will perhaps be of the most value to decision makers when presented in relative terms. This chapter addresses what have been termed the secondary questions. First, the cost to train pilots is compared to the cost to train NFO's. Second, various contributing aircraft communities are compared with each other in terms of average training cost. Third, the eleven geographic sites where Reserve Patrol Aviation takes place are compared according to what percentage of their qualified aviators are out of community.

A. PILOTS vs NFO's

Average statistics, broken down by pilots and NFO's, are summarized below:

	Pilots	NFO's
- Year of training	1984	1984
- Avg. trng. period	24 mos.	22 mos.
- Avg. rank/yrs. svc.	LCDR>11	LCDR>10
- Avg. drills in trng.	151	113
- Avg. ACDUTRA in trng.	33	31
- Avg. flt. hrs. in trng.	239	163
- Avg. sim. hrs. in trng.	27	22

1. Drill Pay

a. Pilots

Since the training was done in 1984 and the rank was Lieutenant Commander, $5454 is drawn from Table 7. This figure is divided by 48 (as explained in Chapter IV) and multiplied by 151 (the average number of drills for pilots) to yield a pilot average drill pay cost of $17,157.

b. NFO's

Again the training was done in 1984 and the rank was Lieutenant Commander, so $5454 is drawn from Table 7. Dividing by 48 and multiplying by 113 (the average number of drills for NFO's) yields an NFO average drill pay cost of $12,840.

2. Active Duty for Training (ACDUTRA) pay

a. Pilots

Using 1984 as the training year and Lieutenant Commander as the rank, $2124 is drawn from Table 8. This figure is divided by 14 (as in Chapter IV) and multiplied by 33 (the average number of ACDUTRA days for pilots) to yield a pilot average ACDUTRA pay cost of $5007.

b. NFO's

Similarly, using 1984 as the training year and Lieutenant Commander as the rank, $2124 is drawn from Table 8. This figure divided by 14 and multiplied by 31 (the average number of ACDUTRA days for NFO's) yields an NFO average ACDUTRA pay cost of $47Ø3.

3. Instructor Costs

a. Pilots

Keeping with the instructor cost assumptions of Chapter IV, half the 239 average flight hours for pilots (119.5) and half the 27 average simulator hours (13.5) are considered to have been flown under the direction of an instructor. This sum of 133 hours is used to calculate the instructor costs involved. Using Lieutenant Commander as the instructor's rank and 1984 as the training year, $5454 is again drawn from Table 7. This figure divided by 48 drills yields a drill pay salary of $113.63 per four-hour drill, or $28.41 per hour. This figure, multiplied by the 133 average hours of instructor time per training period, results in an average instructor cost for pilots of $3778.

b. NFO's

Half the 163 average flight hours for NFO's (81.5), added to half the 22 average simulator hours (11), results in a sum of 92.5 hours of instructor time involved. Multipying the same average instructor hourly wage of

$28.41 by this 92.5 results in an average instructor cost for NFO's of $2628.

4. P-3 Operating Costs

a. Pilots

Table 9 lists the P-3B average operating cost per hour. Since 1984 was the training year, the 1984 operating cost per hour of $854 is multiplied by 239 (the average number of flight hours for pilots). This figure is divided by the number of officers on board the P-3 (5), resulting in an average P-3 operating cost for pilots of $40,821.

b. NFO's

Multiplying the same $854 from Table 9 by 163 (the average number of flight hours for NFO's) and dividing by 5 results in an average P-3 operating cost for NFO's of $27,840.

5. Simulator Operating Costs

a. Pilots

Table 10 lists simulator operating costs per hour. The $324 figure for pilot usage is drawn from the 1984 column of Table 10 and multiplied by the P-3B correction factor of .93 (explained in Chapter IV), which yields $301.32. This figure multiplied by 27 (the average number of simulator hours for pilots) results in an average simulator operating cost for pilots of $8136.

b. NFO's

The $113 figure for NFO usage is drawn from the 1984 column of Table 10 and multiplied by the P-3B correction factor of .93, which yields $105.09. This figure is then multiplied by 22 (the average number of simulator hours for NFO's) to yield a value of $2312. Since these simulators serve two student NFO's at any one time (as explained in Chapter IV), this $2312 is divided by two, resulting in an average simulator operating cost for NFO's of $1156.

6. Summary

The comparison of pilot and NFO training costs is summarized in Table 12. The total cost for pilots exceeds that for NFO's, and by a substantial amount. This result will be surprising to some, and will be examined in greater detail in the final chapter.

TABLE 12

PILOT vs NFO TRAINING COSTS

	Pilot	NFO
Avg. drill pay costs	17,157	12,840
Avg. ACDUTRA pay costs	5,007	4,703
Avg. instructor costs	3,778	2,628
Avg. P-3 operating costs	40,821	27,840
Avg. Sim. operating costs	8,136	1,156
Total Costs	74,899	49,167

B. COMPARISON BY CONTRIBUTING COMMUNITY

Table 6 lists the original communities of the 58 aviators under study with a frequency distribution for each community. The top six communities listed in Table 6 will be compared regarding training cost. The bottom five on the list will not be included because none of these communities are represented by more than two aviators. The A-6 and EA-6B communities have been combined since they use different versions of the same basic aircraft. This community will subsequently be referred to as the A-6 community. The F-4 and F-14 communities have been combined since they serve the same role and since the F-14 has replaced the F-4. This community will subsequently be referred to as the F-14 community.

Average statistics, broken down by original community, are summarized below. The average rank for all groups was Lieutenant Commander, a fact which won't be repeated in the analysis. The abbreviated headings in the left column are spelled out in section A of this chapter:

		S-3	A-6	C-130	F-14	A-3	E-2
- Trng. year		84	84	83	84	82	84
- Avg. trng. mos.		24	26	17	17	19	29
- Avg. yrs. svc.		9	11	12	13	12	9
- Avg. drills		121	131	105	106	130	151
- Avg. ACDUTRA		35	31	25	33	31	31
- Avg. flt. hrs.		191	177	157	172	221	169
- Avg. sim. hrs:	Pilot	N/A	19	N/A	---	---	33
	NFO	25	24	21	23	14	22

1. Drill Pay

a. S-3

The 1984 entry in Table 7 is $5454. This figure divided by 48 and multiplied by 121 yields an S-3 average drill pay cost of $13,748.

b. A-6

The 1984 entry in Table 7 is $5454. This figure divided by 48 and multiplied by 131 yields an A-6 average drill pay cost of $14,885.

c. C-130

The 1983 entry in Table 7 is $5749. This figure divided by 48 and multiplied by 105 yields a C-130 average drill pay cost of $12,576.

d. F-14

The 1984 entry in Table 7 is $5454. This figure divided by 48 and multiplied by 106 yields an F-14 average drill pay cost of $12,044.

e. A-3

The 1982 entry in Table 7 is $5663. This figure divided by 48 and multiplied by 130 yields an A-3 average drill pay cost of $15,337.

f. E-2

The 1984 entry in Table 7 is $5454. This figure divided by 48 and multiplied by 151 yields an E-2 average drill pay cost of $17,157.

2. ACDUTRA pay

a. S-3

The 1984 entry in Table 8 is $2124. This figure divided by 14 and multiplied by 35 yields an S-3 average ACDUTRA pay cost of $5310.

b. A-6

The 1984 entry in Table 8 is $2124. This figure divided by 14 and multiplied by 31 yields an A-6 average ACDUTRA pay cost of $4703.

c. C-130

The 1983 entry in Table 8 is $1784. This figure divided by 14 and multiplied by 25 yields a C-130 average ACDUTRA pay cost of $3186.

d. F-14

The 1984 entry in Table 8 is $2124. This figure divided by 14 and multiplied by 33 yields an F-14 average ACDUTRA pay cost of $5007.

e. A-3

The 1982 entry in Table 8 is $1786. This figure divided by 14 and multiplied by 31 yields an A-3 average ACDUTRA pay cost of $3955.

f. E-2

The 1984 entry in Table 8 is $2124. This figure divided by 14 and multiplied by 31 yields an E-2 average ACDUTRA pay cost of $4703.

3. Instructor Costs

a. S-3

Adding half the average flight hours and half the average simulator hours results in 108 hours of instructor time used. The 1984 entry in Table 7 is $5454. This figure divided by 48, and again by four, yields a drill pay instructor salary of $28.41 per hour. Multiplying this $28.41 by 108 hours yields an S-3 average instructor cost of $3068.

b. A-6

Adding half the average flight hours and half the average simulator hours results in 100 hours of instructor time used. The 1984 entry in Table 7 is $5454, which is a drill pay instructor salary of $28.41 per hour. Multiplying this $28.41 by 100 hours yields an A-6 average instructor cost of $2841.

c. C-130

Adding half the average flight hours and half the average simulator hours results in 90 hours of instructor time used. The 1983 entry in Table 7 is $5749. This figure divided by 48, and again by four, yields a drill pay instructor salary of $29.94 per hour. Multiplying this $29.94 by 90 hours yields a C-130 average instructor cost of $2695.

d. F-14

Adding half the average flight hours and half the average simulator hours results in 97.5 hours of instructor time used. The 1984 entry in Table 7 is $5454, which is a drill pay instructor salary of $28.41 per hour. Multiplying this $28.41 by 97.5 hours yields an F-14 average instructor cost of $277Ø.

e. A-3

Adding half the average flight hours and half the average simulator hours results in 117.5 hours of instructor time used. The 1982 entry in Table 7 is $5663. This figure divided by 48, and again by four, yields a drill pay instructor salary of $29.49 per hour. Multiplying this $29.49 by 117.5 hours yields an A-3 average instructor cost of $3466.

f. E-2

Adding half the average flight hours and half the average simulator hours results in 98.25 hours of instructor time used. The 1984 entry in Table 7 is $5454, which is a drill pay instructor salary of $28.41 per hour. Multiplying this $28.41 by 98.25 hours yields an E-2 average instructor cost of $2791.

4. P-3 Operating Costs

a. S-3

The 1984 entry in Table 9 is $854. Multiplying by 191 and dividing by 5 (the number of officers on board the P-3) yields an average P-3 operating cost for S-3 aviators of $32,623.

b. A-6

The 1984 entry in Table 9 is $854. Multiplying by 177 and dividing by 5 yields an average P-3 operating cost for A-6 aviators of $30,232.

c. C-130

The 1983 entry in Table 9 is $839. Multiplying by 157 and dividing by 5 yields an average P-3 operating cost for C-130 aviators of $26,345.

d. F-14

The 1984 entry in Table 9 is $854. Multiplying by 172 and dividing by 5 yields an average P-3 operating cost for F-14 aviators of $29,378.

e. A-3

The 1982 entry in Table 9 is $774. Multiplying by 221 and dividing by 5 yields an average P-3 operating cost for A-3 aviators of $34,211.

f. E-2

The 1984 entry in Table 9 is $854. Multiplying by 169 and dividing by 5 yields an average P-3 operating cost for A-3 aviators of $28,865.

5. Simulator Operating Costs

a. S-3

The 1984 pilot entry in Table 10 is $324. Multiplying by the P-3B correction factor of .93 yields $301.32. Multiplying by 27 (the overall pilot average simulator time is used since S-3 pilot simulator data is not available) and again by .17 (the proportion of S-3 aviators who are pilots) gives a pilot contribution of $1383.

The 1984 NFO entry in Table 10 is $113. Multiplying by .93 yields $105.09. Multiplying by 25, dividing by 2 (the number of NFO's who share a simulator), and multiplying by .83 (the proportion of NFO's) gives an NFO contribution of $1090.

Combining the pilot and NFO contributions yields an average S-3 simulator operating cost of $2473.

b. A-6

The 1984 pilot entry in Table 10 is $324. Multiplying by .93 yields $301.32. Multiplying by 19 and again by .25 (the proportion of A-6 aviators who are pilots) gives a pilot contribution of $1431.

The 1984 NFO entry in Table 10 is $113. Multiplying by .93 yields $105.09. Multiplying by 24, dividing by 2, and multiplying by .75 (the proportion of NFO's) gives an NFO contribution of $946.

Combining the pilot and NFO contributions yields an average A-6 simulator operating cost of $2377.

c. C-130

The 1983 pilot entry in Table 10 is $208. Multiplying by .93 yields $193.44. Multiplying by 27 (the overall pilot average simulator time is used since C-130 pilot simulator data is not available) and again by .3 (the proportion of C-130 aviators who are pilots) gives a pilot contribution of $1567.

The 1983 NFO entry in Table 10 is $156. Multiplying by .93 yields $145.08. Multiplying by 21, dividing by 2, and multiplying by .7 (the proportion of NFO's) gives an NFO contribution of $1066.

Combining the pilot and NFO contributions yields an average C-130 simulator operating cost of $2633.

d. F-14

The 1984 NFO entry (no pilots exist) in Table 10 is $113. Multiplying by .93 yields $105.09. Multiplying by 23 and dividing by 2 yields an average F-14 simulator operating cost of $1209.

e. A-3

The 1982 NFO entry (no pilots exist) in Table 10 is $192. Multiplying by .93 yields $178.56. Multiplying by 14 and dividing by 2 yields an average A-3 simulator operating cost of $1250.

f. E-2

The 1984 pilot entry in Table 10 is $324. Multiplying by .93 yields $301.32. Multiplying by 33 and again by .5 (the proportion of E-2 aviators who are pilots) gives a pilot contribution of $4972.

The 1984 NFO entry in Table 10 is $113. Multiplying by .93 yields $105.09. Multiplying by 22, dividing by 2, and multiplying by .5 (the proportion of NFO's) gives an NFO contribution of $578.

Combining the pilot and NFO contributions yields an average E-2 simulator operating cost of $5550.

6. Summary

The comparison of training costs by original community is summarized in Table 13. The abbreviated headings in the left column are spelled out in section A, paragraph 6 of this chapter. While a low cost for training C-130 aviators is to be expected, the low cost of training F-14 aviators is not. This point, and others, will be further examined in the final chapter.

TABLE 13

TRAINING COST BY CONTRIBUTING COMMUNITY

	S-3	A-6	C-130	F-14	A-3	E-2
Drill	13,748	14,885	12,576	12,044	15,337	17,157
ACDU	5,310	4,703	3,186	5,007	3,955	4,703
Inst.	3,068	2,841	2,695	2,770	3,466	2,791
P-3	32,623	30,232	26,345	29,378	34,211	28,865
Sim.	2,473	2,377	2,633	1,209	1,250	5,550
Total	57,222	55,038	47,435	50,408	58,219	59,066

C. COMPARISON BY SITE

Table 14 lists out of community aviator use by squadron. The right-hand column lists the percentage of each squadron's qualified aviators who are out of community. While the reader may be tempted to equate high numbers in this column with recruiting difficulties at that site, a warning is in order. The highest percentage of out of community aviators is 20.4 percent in VP-64. VP-64, however, shares its site with VP-66, so the difficulty of manning two squadrons at a single site should be considered. Further inspection of the table shows that VP-66 in fact has more than the average number of total qualified aviators. These points indicate that Table 14 should be used with care.

TABLE 14

OUT OF COMMUNITY AVIATOR USE BY SQUADRON

SITE	SQDN	QUAL AVIA	OUT OF COMM	% OUT OF COMM
NAF Detroit, MI	VP-93	55	7	12.7
NAS Jacksonville, FL	VP-62	71	2	2.8
NAS New Orleans, LA	VP-94	68	12	17.6
NAS South Weymouth, MA	VP-92	69	8	11.6
NAF Washington, DC	VP-68	71	5	7.Ø
NAS Willow Grove, PA	VP-64	54	11	2Ø.4
NAS Willow Grove, PA	VP-66	69	12	17.4
NAS Glenview, IL	VP-6Ø	65	4	6.2
NAS Glenview, IL	VP-9Ø	68	5	7.4
NAS Memphis, TN	VP-67	53	7	13.2
NAS Whidbey Island, WA	VP-69	67	13	19.4
NAS Moffett Field, CA	VP-91	68	2	2.9
NAS Point Mugu, CA	VP-65	66	3	4.5
Total		844	91	
Average		64.9	7	1Ø.8

Table 14 reflects the level of manning difficulties at the various sites. For example, VP-62 in Jacksonville, Florida has both the highest number of qualified aviators (71) and the lowest percentage of out of community aviators (2.8%). VP-91 in Moffett Field, California has similar numbers. This is congruent with the fact that Jacksonville and Moffett Field each host several active duty P-3 squadrons, from which many P-3 aviators leave the active duty Navy and join the VP Reserves. The need to train out of community aviators into the P-3 Reserve Force is less in Jacksonville and Moffett Field than elsewhere.

D. SUMMARY

This chapter addressed what were described initially as the secondary questions. It examined training costs in a relative sense. First, pilot training costs were compared to those of NFC's. Second, training costs were broken down by contributing community. Finally, out of community aviator use was evaluated by geographic drilling site. These examinations have brought to the surface some facts that can be more useful than the simple dollar value arrived at in Chapter IV. The conclusions that can be drawn from this study, and corresponding recommendations, are the subject of the final chapter.

VI. CONCLUSIONS AND RECOMMENDATIONS

The findings of this study include the basic cost to train an out of community aviator into the P-3 Reserve Force, relative costs between different groups, and some insight into the manning difficulties encountered at the various drilling sites. Explanations follow for each of these findings, as well as recommendations that these findings prompted. Finally, one suggestion for further study is made that may more accurately assess the overall success of out of community aviators in the P-3 Reserve Force.

A. DATA LIMITATIONS

The cost to train the average out of community aviator into the P-3 Reserve Force is $55,395. The training process takes an average of 22 months. While this might seem excessive, the reader is reminded that it is done on a part-time basis, separate from the aviator's main civilian career.

While the $55,395 figure (from Table 11) is sound, two facts bear repeating. First, since simulator training time is not documented in a standard fashion throughout all squadrons, simulator usage was calculated using a smaller data base (44 samples) than was used in all other

calculations (58 samples). Second, in assessing instructor costs, the assumption was made that half of each aviator's simulator time and half of his flight time was flown under the direction of an instructor. This assumption was made because of the shortage of data on the instructor time involved.

B. SUMMARY OF FINDINGS

1. Pilots vs NFO's

Many people assume that pilots would transition from one aircraft to another more easily, and at a lower cost, than NFO's. This study found otherwise. Pilots did the transition, on the average, in 24 months at a cost of $74,899. NFO's did it in 22 months at a cost of $49,167 (Table 12). An inspection of the tabular data on page 33 is revealing. Most of the cost difference between pilots and NFO's can be explained by the big difference in flight time used (239 versus 163 hours), which does contribute the most toward training cost. A closer look, though, shows that pilots lead NFO's in all cost groups (average drills, etc.). Remember that only one pilot receives simulator training at a time, so he bears the full cost of its operation. Two NFO's share their simulator, so each bears half the cost of its operation. Pilots, too, accumulate a greater number of flight hours by having to fly the more

mundane logistical flights, where not as much training is accomplished.

2. Contributing Community Comparison

Table 13 lists the average total training cost by contributing community. The reader may be tempted to compare these costs with the overall average cost of $55,395 and label those communities with a lower than average cost as the "winners." Some clarification, however, is in order.

The C-130 community boasts the lowest total cost, but this is an expected result. The C-130 is, like the P-3, a four-engine turboprop aircraft. In fact, it uses the same engines as the P-3. The duties of both pilots and NFO's are fairly similar from one aircraft to the other, with the exception that the C-130 does not engage in Anti Submarine Warfare or the other wartime missions of the P-3. The other five communities listed are carrier-based aircraft, and so are quite different from the P-3 in all respects.

The F-14 community has the second lowest training cost, and this is a surprise. While it should be acknowledged that there are no pilots in the sample (which might have inflated the flight time costs), a look at the tabular information on page 38 reveals two keys to the fighter community's success. First, they are tied with the

C-130 community for the shortest training period (17 months). Second, their training was accompliished in 106 drills, second only to the 105 drills of the C-130 community.

Table 13 indicates another surprising result. The S-3 community incurred a cost higher than average, even though its primary mission, Anti Submarine Warfare, is the same as that of the P-3. This raises the question of whether the S-3 group was dominated by pilots, which might have inflated the flight time cost. An inspection of Table 6, however, shows that only two of the 12 S-3 aviators were pilots. Furthermore, the S-3 community took an average seven months longer to qualify than the F-14 community, which has no familiarity with the Anti Submarine Warfare mission.

Table 13 also shows a high cost for the E-2 community, but only two pilots and two NFO's were included in this group, which makes the figure somewhat unreliable.

Of the two remaining groups, the A-6 community cost less to train than the A-3 community. The A-3 group, like the F-14 group, was represented by no pilots.

C. MANNING DIFFICULTIES

Jacksonville, Florida and Moffett Field, California each host several active duty P-3 squadrons, along with one

P-3 Reserve squadron each. As expected, each site enjoys a high number of qualified aviators. A low percentage of those are out of community (Table 14).

Willow Grove, Pennsylvania and Glenview, Illinois each support two P-3 Reserve squadrons. Willow Grove has 123 qualified aviators, 18.7 percent of whom are out of community. Glenview has 133 qualified aviators, only 6.8 percent of whom are out of community, so Glenview may have the better population base for supporting two squadrons.

Further examination of Table 14 reveals two squadrons (besides VP-64, which is colocated with VP-66) with fewer than 60 qualified aviators. VP-93 in Detroit has 55 qualified aviators, 12.7 percent of whom are out of community. VP-67 in Memphis has 53 qualified aviators, 13.2 percent of whom are out of community. These two squadrons suffer not only from having no active duty P-3 units nearby, but also from being located in areas with a small or deteriorating population base. It is in locations such as this that the out of community aviator is of the most value, filling critical crew positions where there is a shortage of aviators with fleet P-3 experience.

D. RECOMMENDATIONS

1. Training Cost Reduction

Out of community aviators serve a vital function in the Naval Reserve. If the costs, as presented in this study, should be determined to be excessive, the most likely target for reducing costs would be to seek to reduce flight time. A flight time "cap," or upper limit, would reduce training costs substantially since flight time is the single biggest contributor to training cost. This would have to be done, of course, without compromising safety.

2. P-3 Reserve Force Recruiting

In cases where two out of community aviators (from different original communities) compete for the same billet in a P-3 Reserve squadron, the information contained in Table 13 should be used to help decide which aviator gets the billet. Other factors would be weighed in the decision, of course, but Table 13 provides an additional tool with which to make this decision.

3. Drilling Site Selection

Decisions to change a P-3 Reserve squadron's drilling site are made rarely. If any shifts should be considered in the near future, the data collected in Table 14 would be invaluable. The table shows, for example, that P-3 Reserve manning problems are greatly reduced at sites

that have active duty P-3 squadrons present. (It should be mentioned that the other two active duty P-3 bases, Brunswick, Maine and Barbers Point, Hawaii, do not yet host a P-3 Reserve squadron.) It shows, too, the difficulty of trying to man more than one squadron at a single site. This information would be helpful in future drilling site selection.

4. Suggestions for Further Research

The transition of aviators from one aircraft to another, as previously mentioned, takes place only rarely in the active duty Navy. It has been shown that the practice produces valued aviators who serve a key role in the manning of the Naval Reserve. Another measure of the true worth of out of community aviators to Naval Reserve Aviation would be the long-term success of these aviators. Further research could determine whether a proportionate number of out of community aviators go on beyond a successful training experience (as measured in this study) to assume positions of command in Naval Reserve squadrons. Such a study would not only provide a better assessment of the long-term contribution of out of community aviators to the Naval Reserve, but would perhaps suggest that the regular Navy could be more liberal in allowing its aviators to transition from one community to another.

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